Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

PROBLEMS FOR SOLUTION.

ALGEBRA.

287. Proposed by **WALTER D. LAMBERT**, 416 B Street N. E., Washington, D. C.

For what fraction of a year will there be the greatest difference between the interest as computed by the ordinary commercial rule and that computed by the rule of compound interest?

288. Proposed by **DR. L. E. DICKSON**, Associate Professor of Mathematics, The University of Chicago.

Evaluate the determinant which arises in finding the inverse of the transformation, with binomial coefficients,

$$T: \quad \xi_i = \sum_{j=i}^{g-1} \binom{j}{i} x_j \quad (i=0,\ 1,\ \ldots,\ g-1).$$

GEOMETRY.

320. Proposed by **S. F. NORRIS**, Baltimore City College.

Lines are drawn from a fixed point P_1, meeting a fixed circle in P_2. On P_1P_2 a point P is taken so that $P_1P \times P_1P_2 = k^2$. Find the locus of P. Solve by analytic methods, using rectangular coordinates, and putting the result in the form,

$$(x_1^2+y_1^2-r^2)[(x-x_1)^2+(y-y_1)^2]+2k^2(x_1x+y_1y-x_1^2-y_1^2)+k^4=0.$$

321. Proposed by **J. SCHEFFER, A. M.**, Kee Mar College, Hagerstown, Md.

Prove by plane geometry the following interesting theorem:

If from a point in the plane of a triangle perpendiculars are demitted upon the three sides of the triangle, and if the area of the triangle formed by connecting the feet of these perpendiculars is denoted by $\triangle'$, *the distance of the assumed point from the center of the circle circumscribed about the original triangle by* R', *the radius of the circumscribed circle by* R, *and the area of the pedal triangle by* $\triangle$, *then will* $\triangle'/\triangle = \pm[(R^2-R'^2)/R^2]$.

CALCULUS.

242. Proposed by **J. H. MEYER, S. J.**, Augusta, Ga.

A given sphere is to be formed into a solid composed of two equal cones on opposite sides of a common base, in such a manner that its surface may be the least possible. Find the dimensions of the solid, and compare its surface with that of the sphere.

243. Proposed by **R. D. CARMICHAEL**, Anniston, Ala.

The usual method for the solution of a differential equation in the form (see Cohen, *Differential Equations*, p. 22)

$$x^r y^s(my\,dx+nx\,dy)+x^\rho y^\sigma(\mu y\,dx+\nu x\,dy)=0$$

fails when (1) $n=am$, (2) $\nu=a\mu$, (3) $s-\sigma \neq a(r-\rho)$. Find the solution when the relations (1) and (2) hold. (Note that the solution desired does not depend on (3).)

244. Proposed by **G. B. M. ZERR, Ph. D., Professor of Mathematics in Central Manual Training School, Philadelphia, Pa.**

Fine the volume common to the solids bounded by the surfaces
$$x^{2/3}+y^{2/3}+z^{2/3}=a^{2/3} \text{ and } x^{1/3}z^{2/3}=(a^{1/3}-x^{1/3})(x^{2/3}+y^{2/3}).$$

MECHANICS.

205. Proposed by **PROF. R. D. CARMICHAEL, Anniston, Ala.**

Given two points A and B not in the same horizontal nor in the same vertical line; to find the path from A to B along which a particle will slide from rest under the force of gravity alone so that the average velocity along the curve shall be a maximum.

206. Proposed by **W. J. GREENSTREET, M. A., Editor of The Mathematical Gazette, Stroud, England.**

A rigid square $ABDC$ made by smooth wires is fixed with A vertically above D. Two small equal spherical elastic beads slide down BD, CD, starting simultaneously from B and C. Find the ratio of their velocities of approach and separation at D, and how far they will separate after impact.

NOTES AND NEWS.

The eminent mathematician, Yoshio Mikami, is translating Dr. Halsted's *Rational Geometry* for publication in Japan. F.

Dr. G. B. M. Zerr has been appointed Professor of Mathematics in the Central Manual Training School of Philadelphia, at a salary of $2000 per year. F.

Professor G. W. Greenwood has resigned his position as Professor of Mathematics in Roanoke College and gone into business in Dunbar, Pa. He will, however, continue his contributions to the MONTHLY. F.

Miss Hazel Anderson, who has just received the Master's degree at the University of Chicago, will be Instructor in Mathematics at the Manual Training High School, Indianapolis, Ind. S.

Mr. G. R. Clements, who took the Master's degree at the University of Chicago in August, has been appointed to an Instructorship in Mathematics at Williams College, Williamstown, Mass. S.

Miss Mary E. Wells, who received the Master's degree at the University of Chicago in June, returns to an Instructorship in Mathematics at Mt. Holyoke College, where she graduated in 1906. S.

Dr. R. L. Boerger, formerly instructor at the University of Missouri, has been appointed to an Instructorship in Mathematics at the University of Illinois. Mr. Boerger received the Doctor's degree at the University of Chicago in August, 1907. S.